What is claimed is:

1.   A device for automatically detecting a calibration termination of

a geomagnetic sensor, comprising:

a detection unit for detecting signals X and Y outputted from X-axis

and Y-axis coils of the geomagnetic sensor, respectively;

a calculation unit for calculating slopes dX/dt and dY/dt of the signals

X and Y, respectively, and the number of sign changes N_x and N_y of the

slope dX/dt of the signal X and the slope dY/dt of the signal Y, respectively;

a display unit for displaying the calibration termination and a

calibration progress state for the geomagnetic sensor; and

a control unit for outputting a driving signal to the display unit to

display a state of the calibration termination based on the slope dX/dt of the

signal X and the slope dY/dt of the signal Y and the number of slope sign

changes N_x and N_y.

2.   The device as claimed in claim 1, wherein the detection unit

detects the number of revolutions N_s of the geomagnetic sensor when the

geomagnetic sensor revolves more than once for calibration implementation

of the geomagnetic sensor.

3. The device as claimed in claim 2, wherein the control unit

outputs the driving signal to the display unit to display the calibration

progress state when the number of sign changes N_x of the slope dX/dt of the

signal X and the number of sign changes N_y of the slope dY/dt of the signal

Y are both less than $2N_s$.

4. The device as claimed in claim 2, wherein the control unit

outputs the driving signal to the display unit to display the calibration

termination state, and outputs a control signal to the detection unit to stop

detecting signals, when the number of sign changes N_x of the slope dX/dt of

the signal X and the number of sign changes N_y of the slope dY/dt of the

signal Y both equal $2N_s$, and the slope dX/dt of the signal X and the slope

dY/dt of the signal Y are each identical to approximate values of an initial

slope dX_0/dt of the signal X and an initial slope dY_0/dt of the signal Y,

respectively.

5. The device as claimed in claim 1, wherein the calculation unit

comprises:

a slope calculator for calculating the slopes dX/dt and dY/dt of the

signals X and Y, respectively, inputted from the detection unit;

a sign change number-of-times calculator for detecting points at

which the sign of the slope dX/dt of the signal X and the sign the slope dY/dt

of the signal Y change from positive to negative or negative to positive, and

for outputting the number of slope sign changes N_x and N_y; and

a comparator for comparing the slope dX/dt of the signal X and the

slope dY/dt of the signal Y with reference sinusoidal and cosine functions,

and for calculating a signal corresponding to the calibration progress state.

6. A method for automatically detecting a calibration termination

for a geomagnetic sensor, comprising:

detecting signals X and Y outputted from X-axis and Y-axis coils of the geomagnetic sensor, respectively;

calculating slopes dX/dt and dY/dt of the signals X and Y, respectively, and the number of sign changes N_x and N_y of the slope dX/dt of the signal X and the slope dY/dt of the signal Y, respectively;

deciding a calibration termination timing based on the slopes dX/dt and dY/dt of the signals X and Y and the number of slope sign changes N_x and N_y; and

displaying the calibration termination and a calibration progress state for the geomagnetic sensor.

7.   The method as claimed in claim 6, wherein the detection step detects the number of revolutions N_s of the geomagnetic sensor when the geomagnetic sensor revolves more than once for calibration implementation of the geomagnetic sensor.

8.   The method as claimed in claim 7, wherein the decision step

outputs a corresponding signal to display the calibration progress state on a

display unit when the number of sign changes N_x of the slope dX/dt of the

signal X and the number of sign changes N_y of the slope dY/dt of the signal

Y are both less than $2N_s$.

9.   The method as claimed in claim 7, wherein the decision step

outputs a driving signal to display the calibration termination state, and

outputs a control signal to stop detecting an input signal, when the number

of sign changes N_x of the slope dX/dt of the signal X and the number of sign

changes N_y of the slope dY/dt of the signal Y both equal $2N_s$, and the slope

dX/dt of the signal X and the slope dY/dt of the signal Y are identical to

approximate values of an initial slope dX_0/dt of the signal X and an initial

slope dY_0/dt of the signal Y, respectively.

10.   The method as claimed in claim 7, wherein the calculation step

comprises:

calculating the slopes dX/dt and dY/dt of the signals X and Y, respectively;

detecting points at which the sign of the slope dX/dt of the signal X and the sign of the slope dY/dt of the signal Y change from positive to negative or negative to positive, and outputting the number of slope sign changes N_x and N_y; and

comparing the slope dX/dt of the signal X and the slope dY/dt of the signal Y with reference sinusoidal and cosine functions, and calculating a signal corresponding to the calibration progress state.